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PSYCHOPATHY, INTELLIGENCE, AND RECIDIVISM IN CHILD MOLESTERS

Evidence of an Interaction Effect

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The authors studied the relationships between psychopathy, intelligence, and offending in a sample of treated child molesters ($N = 216$). Regression analyses showed that psychopathy (as measured by the Psychopathy Checklist–Revised) was strongly related to both offense history and recidivism during follow-up. Intelligence (assessed using four-subtest short forms of the Wechsler Adult Intelligence Scale–Revised and Third Versions) was not related to offending. However, there was a significant interaction between intelligence and psychopathy on recidivism: Offenders with relatively low intelligence and high psychopathy scores were more than 4 times as likely to have received a sexual reconviction as other offenders. Results are discussed in terms of implications for risk assessment.

Keywords: child sexual offenders; pedophilia; recidivism; intelligence; psychopathy

Psychopathy is a personality construct that is robustly correlated with criminal behavior (Hare, Clark, Grann, & Thornton, 2000). As measured by the Psychopathy Checklist–Revised (PCL-R; Hare, 1991), psychopathic personality has been linked to a host of negative outcomes, including an increased amount of offending, particularly violent offending (Hare, 1991), increased institutional misconducts (Guy, Edens, Anthony, & Douglas, 2005), and higher rates of recidivism after release (Hemphill, Hare, & Wong, 1998). Personality traits associated with psychopathy include superficiality, grandiosity, impulsivity, emotional shallowness, and a lack of remorse or empathy (Hare, 1991).

Intelligence is also thought to be related to criminality, a view that has received mixed support in the literature dating back several decades. In a review of the early research, Hirschi and Hindelang (1977) found that low intelligence was associated with delinquent behavior, as measured by both official records and self reports. In addition, they found that intelligence was a better predictor of delinquency than social class or race. Subsequently, in a meta-analysis, Gendreau, Little, and Goggin (1996) reported a significant mean effect size of $r = .07$ between low intelligence and recidivism among adult offenders across 32 studies ($N = 21,369$).

Guay, Ouimet, and Proulx (2005) discussed two possible hypotheses for the relationship between intelligence and criminal behavior. The first, endorsed by Hirschi and Hindelang

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(1977), is that intelligence is indirectly linked to offending through its effect on mediating factors such as school and job performance, adaptation, and opportunities for pro-social success. Although it is apparent that intelligence would be related to school performance, Fergusson and Horwood (1995) reported data from a longitudinal birth cohort study suggesting that there is a strong correlation between cognitive factors and externalizing behaviors throughout development and that this relationship can explain the later correlation between academic achievement and delinquency. The second hypothesis refers to a direct relationship in which people with lower intelligence are more prone to crime because of their weakness in relevant cognitive abilities, such as anticipating the consequences of their actions and recognizing suffering in others (Guay et al., 2005). But note that individuals with such weaknesses might also be described as having a lack of remorse or empathy, or behaving impulsively—traits that are associated with psychopathy. This, together with the evidence that both variables are related to criminal behavior, raises the question of what effect psychopathy and intelligence may have in combination. In particular, researchers have been concerned about whether intelligence might moderate the effect of psychopathy on criminal behavior—specifically, whether psychopathic personality might be a stronger predictor of offending for individuals with relatively low intelligence compared to those with relatively high intelligence.

In an early study with incarcerated offenders, Heilbrun (1979) found evidence for such an interaction between psychopathy and intelligence on violent and impulsive offending. Heilbrun divided a sample of incarcerated offenders into four groups based on median splits on measures of psychopathy and intelligence and found that the group with higher psychopathic scores and lower IQ scores had more previous violent and impulsive offenses than those with high psychopathy and high IQ scores and both low psychopathy groups. Heilbrun (1982) proposed that a combination of poor impulse control, low empathy, and negative socialization was implicated in the interaction between psychopathy and intelligence.

A problematic aspect of Heilbrun's studies is their reliance on various self-report methodologies to assess psychopathy. Thus, it is important to re-examine the relationship between psychopathy, intelligence, and offending using a modern, well-validated instrument such as the PCL-R. Recently, Walsh, Swogger, and Kosson (2004) attempted to replicate Heilbrun's (1979) results with a sample of jail inmates serving short sentences (less than 1 year) using the PCL-R. Regression analyses found main effects for psychopathy and intelligence in postdicting the number of past violent offenses of the sample, but the interaction was not significant. Comparisons of extreme groups (formed by grouping upper and lower thirds of IQ and PCL-R scores) showed that among European Americans (but not African Americans), low-IQ psychopathic offenders had significantly more charges for violent offenses (including sexual violence) than any other group, although Walsh et al. noted that this appeared to reflect an additive effect of psychopathy and intelligence on violence, rather than interactive. They also suggested that Heilbrun's results could be understood in terms of additive effects of psychopathy and intelligence (see also Holland, Beckett, & Levi, 1981).

The present study investigates whether intelligence moderates the relationship between psychopathy and recidivism in child molesters. Sexual offenders have long been recognized as a special subtype of offenders, because the etiology of their criminal behavior may involve particular factors (e.g., sexual deviance) that do not apply to offenders in general (Hanson & Bussière, 1998; Hanson & Morton-Bourgon, 2005; but cf. Miethe, Olson, & Mitchell, 2006). In recent years, risk assessment for sex offenders has emerged as a major area of research, and various actuarial instruments have been developed that have good validity for predicting

recidivism, such as the Static-99 (Hanson & Thornton, 1999; for a review, see Beech, Fisher, & Thornton, 2003). Typically, these instruments include a number of offense-history variables, known as static risk factors, which have been shown to be related to sexual reoffending (e.g., number of prior sexual offenses, male victims, stranger victims). The static factors are summed to yield a total score that serves as the basis of risk prediction.

Barbaree, Seto, Langton, and Peacock (2001) compared the utility of five actuarial instruments, including the Static-99 and the PCL-R, for predicting recidivism in sex offenders. Recidivism was defined as a conviction for a new sexual offense, serious offense, or any offense during the follow-up period ($M = 4.5$ years), and instruments were assessed in terms of areas under the receiver operating characteristic curve (AUC). They found that two actuarial measures—the Static-99 and Sex Offender Risk Appraisal Guide (SORAG; Quinsey, Harris, Rice, & Cormier, 1998)—were the best overall predictors of recidivism, with average AUC values of .77, .71, and .68 for any recidivism, serious recidivism, and sexual recidivism, respectively. However, the PCL-R significantly predicted serious recidivism and any recidivism (AUCs = .63 and .68, respectively), and approached significance for sexual recidivism (AUC = .61, $p < .07$). The predictive validity of the PCL-R is not surprising because it was positively correlated with the actuarial instruments; indeed, the SORAG includes the PCL-R as an important component.

The goal of the present study was to investigate whether intelligence moderated the relationship between psychopathic personality, as measured by the PCL-R, and recidivism in child molesters. Participants were men who had received treatment at the Kia Marama program for adult sexual offenders against children and were then released to the community. We also conducted a parallel set of analyses to examine the relationship between intelligence, actuarial risk (as measured by the Static-99), and recidivism. The rationale for this was to determine whether any possible interactive effect was specific to the interpersonal and behavioral features of psychopathy or also applied to actuarial risk.

METHOD

PARTICIPANTS

The sample consisted of all 216 males who completed the Kia Marama program at Rolleston Prison, Christchurch, New Zealand, between 1993 and 2000 and for whom both a PCL-R score and an IQ score were available. Kia Marama is a 32-week prison-based treatment program based on cognitive-behavioral and relapse-prevention principles. Participants attend 3-hour group treatment sessions 3 times per week and reside in the adjacent therapeutic community unit. A more thorough description of this program can be found in Hudson, Marshall, Ward, Johnston, and Jones (1995). All participants gave written consent for their file information to be used for research and evaluation purposes when entering the program.

MEASURES

Psychopathy. Subjects were scored on the PCL-R as part of a posttreatment assessment. The PCL-R was designed to measure psychopathy in offender populations and has demonstrated reliability and validity. Hare (1991) reported that the interrater reliability of total

scores among a pooled sample of male prison inmates was .91. The PCL-R consists of 20 items rated on a 3-point scale ranging from 0 to 2, resulting in a maximum total score of 40. Hare (1991) argued that psychopathy is most usefully viewed as a dimensional construct, with an offender's total score reflecting the extent that the offender matches the description of a prototypical psychopath. For situations in which a categorical conceptualization is required, a cutoff score of 25 has support as being appropriate for diagnosis of a psychopathic personality (Hare et al., 2000; Rice, Harris, & Cormier, 1992). A dimensional interpretation of psychopathy was used in this study; therefore, the term *psychopathy* refers to the level of psychopathic traits present according to PCL-R scores, rather than a diagnosis.

Intelligence. Intelligence testing is conducted routinely at Kia Marama as part of the pre-treatment assessment battery for the purpose of ascertaining ability to cope with treatment content. The entry guidelines of the program require an IQ of 70 or greater. IQ was assessed using the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999), and prior to the WASI's development, a four-subtest short version (Picture Completion, Block Design, Information, and Arithmetic) of the WAIS-R (Reynolds, Willson, & Clark, 1983). Both of these tests have demonstrated good reliability and validity as screening tools for estimating full-scale intelligence (Reynolds et al., 1983; Wechsler, 1999).

Actuarial risk. The Static-99 (Hanson & Thornton, 1999) is an instrument designed to assess risk of recidivism in sex offenders. It consists of 10 items primarily relating to offense history, each of which is rated on a 0 to 1 or a 0 to 3 scale. The total maximum score is 12, with higher scores reflecting more risk. The Static-99 has consistently been shown to have good predictive accuracy for sexual recidivism (Barbaree et al., 2001). Static-99 scores were previously rated from file information for all participants. As a reliability check, two raters had independently scored a subset of 10 cases; agreement for these cases was 100%.

Offending. The number of previous convictions for sexual offenses and other nontrivial offenses (not including convictions for which the current sentence was received) were recorded for each participant during the pretreatment assessment phase. The information was obtained during an interview and confirmed against official records. Information on sexual, violent, and general reconvictions as of January 2001 (between 1 and 7 years after completion of treatment, with an average follow-up time of 5 years) was obtained from the official criminal history database maintained by the New Zealand Department of Corrections.

RESULTS

DEMOGRAPHIC AND OFFENSE INFORMATION

The men were aged between 18 and 74 years, with an average age of 41.1 ($SD = 12.0$). In terms of ethnicity, 75.9% ($n = 164$) were of New Zealand European descent, 21.8% ($n = 47$) identified as New Zealand Maori, and 2.3% ($n = 5$) other. Educational attainment was correlated with IQ, $r = .50$, $p < .001$, and ranged from primary only (9%; $n = 19$) to some tertiary (10%; $n = 22$), with the majority in between having completed some secondary school: 36% ($n = 78$) up to 2 years; 34% ($n = 73$) 3 years; and 11% ($n = 24$) between 4 and 5 years. More than half (57%; $n = 123$) of the sample were incest offenders whose victims were exclusively

TABLE 1: Means and Standard Deviations for Test Scores, Prior Convictions, and Recidivism

	Whole Sample (<i>N</i> = 216)		Incest (<i>n</i> = 124)		Extrafamilial (<i>n</i> = 92)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
PCL-R	8.2	7.3	7.2*	6.4	9.5*	8.1
IQ	98.9	14.8	96.8*	14.1	101.7*	15.4
Static-99	2.2	2.0	1.3***	1.5	3.5***	2.0
Prior convictions						
Sexual	1.4	3.5	0.7**	2.1	2.5**	4.7
Other	8.6	24.8	6.1	13.8	12.0	34.2
<i>Recidivism</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>
Sexual	7.9	17	4.8	6	12.0	11
Violent	8.3	18	9.7	12	6.5	6
General	12.0	26	12.9	16	10.9	10

Note. PCL-R = Psychopathy Checklist-Revised.

* $p < .05$. ** $p < .01$. *** $p < .001$, significant differences between incest and extrafamilial offenders.

family members, whereas 43% ($n = 93$) were extrafamilial offenders with at least one unrelated victim.

Table 1 shows the average number of prior sexual and other convictions for the whole sample and for incest and extrafamilial offenders separately. The average number of prior sexual convictions of the sample was 1.4 ($SD = 3.5$), ranging from 0 (66% of the sample; $n = 142$) to a maximum of 28. Forty-eight percent ($n = 104$) had no prior convictions for other offenses. The maximum was 220 prior convictions, and the average was 8.6 ($SD = 24.8$). Regarding recidivism, 19.4% ($n = 42$) of the 216 men had received a new conviction of any kind by the end of the follow-up period after being released from prison. The percentages of men who received convictions for new sexual, violent, and general offenses were 7.9% ($n = 17$), 8.3% ($n = 18$), and 12.0% ($n = 26$), respectively. Of those convicted of a new sexual offense, the average time between release and offending was approximately 2 years (23.9 months) and ranged from 36 days to 5.9 years.

PSYCHOPATHY, INTELLIGENCE, AND ACTUARIAL RISK

Average PCL-R, IQ, and Static-99 scores for the sample and for incest and extrafamilial offenders separately are also shown in Table 1. The average PCL-R score of the sample was 8.2 ($SD = 7.3$). Scores ranged from 0 to 33, and the median was 6.5. Using a cutoff score of 25, 4.6% ($n = 10$) of the sample could be diagnosed as psychopaths. This is lower than most prison populations (Hare, Hart, & Harpur, 1991) and is likely because of the sample consisting entirely of child molesters, who typically have lower PCL-R scores than rapists and nonsexual offenders (e.g., Porter et al., 2000). Because of the relatively low distribution of PCL-R scores in this sample, it is important to emphasize that the term *psychopathy* is used here to refer to the dimensional construct of traits, rather than the clinical cutoff. There was a significant relationship between PCL-R scores and age, $r = -.22$, $p < .01$, with higher PCL-R scorers tending to be younger.

The IQ scores of the sample showed a wide range from 67 to 161 (3 offenders who scored less than the entry criteria cutoff of 70 were granted admission based on judgments

of their ability to cope with the program requirements), with a mean of 98.9 ($SD = 14.8$) and a median of 99.5. Older offenders tended to have higher IQ scores, $r = .23$, $p < .01$. There was a negative correlation between IQ and PCL-R scores, $r = -.20$, $p < .01$.

Static-99 scores ranged between 0 and 9, with a mean score of 2.2 ($SD = 2.0$) and a median of 2. The sample was therefore in the moderate- to low-risk category overall (Hanson & Thornton, 1999). Static-99 scores were negatively correlated with age, $r = -.21$, $p < .01$, but were unrelated to IQ scores, $r = -.03$, *ns*. There was a positive correlation between Static-99 and PCL-R scores, $r = .40$, $p < .001$.

OFFENDING

Correlations between PCL-R, IQ, and Static-99 scores and the offense variables (prior sexual and other convictions, and sexual, violent, and general reconvictions) are shown in Table 2. PCL-R scores were positively related to previous sexual offenses, $r = .18$, $p < .01$; and previous other offenses, $r = .40$, $p < .001$; as well as all three types of recidivism: sexual, $r = .25$, $p < .001$, violent, $r = .25$, $p < .001$, and general, $r = .34$, $p < .001$. These results are consistent with prior studies that have demonstrated that psychopathy is a robust predictor of recidivism (Hemphill et al., 1998). IQ scores were unrelated to prior sexual and nonsexual offending and to general recidivism. However, correlations with sexual and violent recidivism were significant or approached significance, such that those offenders with relatively low IQ were more likely to be reconvicted for a violent offense, $r = -.14$, $p < .05$, and the correlation for sexual recidivism approached significance, $r = -.13$, $p < .07$. As expected, Static-99 scores correlated strongly with prior sexual convictions, $r = .63$, $p < .001$, and also prior other convictions, $r = .30$, $p < .001$. Static-99 scores were also significantly related to sexual recidivism, $r = .23$, $p < .01$, and general recidivism, $r = .16$, $p < .05$, and approached significance for violent recidivism, $r = .13$, $p < .07$.

INTERACTION BETWEEN PSYCHOPATHY AND INTELLIGENCE ON OFFENDING

We conducted hierarchical regressions in which prior offending behavior was first predicted by PCL-R and IQ scores, and then the interaction term was added to the model. For number of prior sexual convictions, there was a significant effect of PCL-R score, $\beta = .20$, $p < .01$, but neither IQ nor the interaction term reached significance, $\beta = .09$ and $\beta = .002$, respectively, both *ns*. Similar results were obtained for number of prior nonsexual convictions: The PCL-R coefficient was significant, $\beta = .37$, $p < .001$, whereas the IQ and interaction coefficients were not, $\beta = -.01$ and $\beta = -.04$, both *ns*. Thus, higher PCL-R scores were associated with increased levels of prior offending, both sexual and nonsexual, but IQ was unrelated to offense history.

Next we used recidivism during follow-up as the outcome variable in a similar set of regression analyses. For sexual recidivism, the PCL-R was a significant predictor, $\beta = .19$, $p < .01$, but IQ was not significant, $\beta = -.09$, *ns*. The PCL-R \times IQ interaction contributed significant additional variance, $\beta = -.16$, $R^2_{\text{inc}} = .02$, $p < .05$. Similar results were obtained with other recidivism variables. For violent recidivism, the main effect of PCL-R and the PCL-R \times IQ interaction were significant, $\beta = .19$, $p < .05$ and $\beta = -.16$, $R^2_{\text{inc}} = .02$, $p < .05$, respectively; but the effect of IQ was not, $\beta = -.10$, *ns*. The PCL-R and PCL-R \times IQ interaction were significantly related to general recidivism, $\beta = .26$, $p < .001$ and $\beta = -.16$, $R^2_{\text{inc}} = .03$, $p < .05$,

TABLE 2: Correlations Between PCL-R, IQ, and Static-99 Scores and Offense Variables

	Prior Convictions		Recidivism		General	PCL-R	IQ
	Sexual	Other	Sexual	Violent			
PCL-R	.18**	.40***	.25***	.25**	.34***		-.20**
IQ	.05	-.09	-.13	-.14*	-.11	-.20**	
Static-99	.63***	.30***	.23**	.13	.16*	.40***	-.03

Note. PCL-R = Psychopathy Checklist-Revised.

* $p < .05$. ** $p < .01$. *** $p < .001$.

respectively; but IQ was not, $\beta = -.05$, *ns*. Thus, for each type of recidivism, higher PCL-R scores were associated with increased risk of reoffending, and there was a significant interaction between PCL-R and IQ.

To examine the interaction between psychopathy and intelligence on recidivism more closely, we dichotomized both PCL-R and IQ scores by performing median splits (median PCL-R score = 6.5; median IQ score = 99.5). Offenders were then assigned to one of four groups: High PCL-R–High IQ, High PCL-R–Low IQ, Low PCL-R–High IQ, and Low PCL-R–Low IQ (note that the means for the two High PCL-R groups, 12.5 and 14.6, are much less than traditional cutoffs for a psychopathic diagnosis; the label, therefore, only refers to relatively high levels of psychopathic traits within this sample). Table 3 shows the number of cases, mean PCL-R and IQ scores, and the recidivism rates for sexual, violent, and general reoffending for each group. Kaplan–Meier survival analyses were used to compare the recidivism rates of the four groups while taking into account possible differences in time at risk. The percentage of cases that reoffended differed significantly across groups for sexual, $\chi^2 = 14.85$, $p < .01$; violent, $\chi^2 = 14.53$, $p < .01$; and general recidivism, $\chi^2 = 18.53$, $p < .001$ (all *dfs* = 3). For each type of recidivism, reconviction rates for the High PCL-R groups were greater than for the corresponding Low PCL-R groups, and the High PCL-R–Low IQ group had the highest reconviction rates of all. Kaplan–Meier pairwise comparisons (*df* = 1) confirmed that this group was significantly more likely to have been reconvicted of a sexual offense than the other three groups: $\chi^2 = 5.01$, $p < .05$ for High PCL-R–High IQ; $\chi^2 = 8.24$, $p < .01$ for Low PCL-R–High IQ; and $\chi^2 = 5.67$, $p < .05$ for Low PCL-R–High IQ. The High PCL-R–Low IQ group also had a higher rate of violent recidivism than either Low PCL-R group: $\chi^2 = 7.88$, $p < .01$ for Low PCL-R–High IQ; and $\chi^2 = 7.48$, $p < .01$ for Low PCL-R–Low IQ. For general recidivism, the High PCL-R–Low IQ group differed significantly from the Low PCL-R–High IQ group, $\chi^2 = 5.94$, $p = .05$ and the Low IQ–Low PCL-R group, $\chi^2 = 14.20$, $p = .001$, and approached significance with regard to the High PCL-R–High IQ group, $\chi^2 = 3.83$, $p < .06$.

In summary, a significant interaction effect was found for predicting recidivism during follow-up, with a combination of high PCL-R and low IQ scores being linked to significantly greater sexual, violent, and general recidivism. By contrast, there was no interaction between PCL-R and IQ scores when postdicting prior sexual or nonsexual offenses.

To examine the possibility that the interaction effect found between psychopathy and intelligence on recidivism is not specific to psychopathy but reflects a more general interaction between intelligence and overall risk level, we carried out the regression analyses and median split comparisons again, but using the Static-99 instead of the PCL-R. For

TABLE 3: Group Sizes and Recidivism Rates of the Total Sample and Four Groups Following Median Splits of IQ and PCL-R Scores

	N	Mean Scores		% Recidivism		
		PCL-R	IQ	Sexual	Violent	General
Total sample	216	8.2	98.9	7.9	8.3	12.0
Group						
High PCL-R–High IQ	47	12.5	110.4	4.3*	8.5	10.6
High PCL-R–Low IQ	61	14.6	87.0	18.0	18.0	24.6
Low PCL-R–High IQ	61	2.5	110.9	3.3*	3.3*	9.8*
Low PCL-R–Low IQ	47	3.0	87.2	4.3*	2.1*	0.0*

Note. PCL-R = Psychopathy Checklist–Revised.

*Significantly lower rate of recidivism than the High PCL-R–Low IQ group according to Kaplan–Meier pairwise comparisons.

TABLE 4: Group Sizes and Recidivism Rates of the Total Sample and Four Groups Following Median Splits of IQ and Static-99 Scores

	N	Mean Scores		% Recidivism		
		Static-99	IQ	Sexual	Violent	General
Total sample	216	8.2	98.9	7.9	8.3	12.0
Group						
High Static-99–High IQ	56	3.6	111.5	5.4	3.6	10.7
High Static-99–Low IQ	65	3.6	86.4	13.8	13.8	20.0
Low Static-99–High IQ	52	0.4	109.9	1.9	7.7	9.6
Low Static-99–Low IQ	43	0.5	88.1	9.3	7.0	14.0

sexual recidivism, the Static-99 was a significant predictor, $\beta = .24$, $p < .001$; but neither IQ nor the interaction term reached significance, $\beta = -.11$, *ns*, and $\beta = -.11$, $R^2_{inc} = .01$, *ns*, respectively. Results were similar for general recidivism, with Static-99 having a significant main effect, $\beta = .16$, $p < .05$; but neither IQ, $\beta = -.10$, *ns*, nor the interaction, $\beta = -.11$, *ns*, $R^2_{inc} = .01$, *ns*, were significant predictors. For violent recidivism, the Static-99 and IQ both approached significance as main effects, $\beta = .13$, $p < .06$ and $\beta = -.12$, $p < .07$, respectively; and the interaction term was significant, $\beta = -.16$, $p < .05$, $R^2_{inc} = .03$, $p < .05$.

Table 4 shows the percentages of sexual, violent, and general recidivism for four groups formed by dichotomizing the Static-99 and IQ scores using median splits (median Static-99 score = 2; median IQ score = 99.5); group sizes and mean scores are also given. Kaplan–Meier analyses across the four groups ($df = 3$) indicated no significant overall group differences: $\chi^2 = 7.32$, *ns* for sexual; $\chi^2 = 5.02$, *ns* for violent; and $\chi^2 = 7.27$, *ns* for general recidivism. These results indicate that the above findings with regard to the PCL-R are not reflective of a general interaction between intelligence and risk on recidivism.

PREDICTIVE VALIDITY

The interaction between psychopathy and intelligence suggests that the predictive validity of the PCL-R for recidivism might depend on the offender's IQ. Table 5 shows the results

TABLE 5: Areas Under the Receiver Operating Characteristic Curve (AUC) for the PCL-R and Static-99 Predicting Sexual, Violent, and General Recidivism

	<i>N</i>	AUC for Recidivism		
		<i>Sexual</i>	<i>Violent</i>	<i>General</i>
Full sample				
PCL-R	216	.73**	.71**	.71***
Static-99	216	.69**	.58	.62
Low IQ				
PCL-R	108	.76**	.82***	.86***
Static-99	108	.68*	.70*	.71*
High IQ				
PCL-R	108	.60	.53	.53
Static-99	108	.73	.40	.53

Note. PCL-R = Psychopathy Checklist-Revised.

* $p < .05$. ** $p < .01$. *** $p < .001$.

of a comparative analysis in which the predictive validity of the PCL-R and Static-99 for each type of recidivism, as measured by the AUC, was computed separately for relatively high- and low-IQ offenders and the full sample. For the PCL-R, predictive validities for the full sample were statistically significant for each type of recidivism and increased for the low-IQ group, with AUC values of .76, .82, and .86 for sexual, violent, and general recidivism, respectively. By contrast, the Static-99 did not significantly predict violent or general recidivism for the full sample, and the AUC value for sexual recidivism was about the same for the low-IQ group as for the sample as a whole. Thus the PCL-R showed greater predictive validity for recidivism than the Static-99, particularly for low-IQ offenders.

INCEST AND EXTRAFAMILIAL OFFENDER COMPARISONS

Table 1 illustrates several important differences between the groups of incest ($N = 124$) and extrafamilial ($N = 92$) offenders in our sample. Compared to incest offenders, extrafamilial offenders had significantly greater PCL-R scores overall, $t(168.45) = 2.22$, $p < .05$, and Static-99 scores, $t(161.87) = 8.74$, $p < .001$; and had a greater average number of previous convictions for sexual offenses, $t(117.65) = 3.58$, $p < .01$. Consistent with this increased risk, extrafamilial offenders also had a higher rate of sexual recidivism (12.0%) than incest offenders (4.8%), a difference that approached significance despite the reduced sample sizes, $\chi^2(df = 1) = 3.69$, $p < .06$. IQ scores were also significantly greater for extrafamilial offenders, $t(186.54) = 2.39$, $p < .05$. For these reasons, it is worth exploring the interaction between PCL-R scores and IQ scores on sexual recidivism for these two groups separately.

Table 6 shows the samples sizes, mean PCL-R and IQ scores, and percentage of sexual reconstructions for the groups resulting from median splits conducted separately for incest offenders and extrafamilial offenders. The median PCL-R and IQ scores were 6.0 and 96.0, respectively, for incest offenders, and 7.0 and 104.0, respectively, for extrafamilial offenders. For both incest and extrafamilial offenders, the group with relatively high PCL-R scores and low IQ scores had the highest rate of sexual recidivism, as was the case for the sample as a whole. Kaplan-Meier survival analyses indicated that although the overall

TABLE 6: Group Sizes and Recidivism Rates of the Total Sample and Four Groups Following Median-Splits of IQ and PCL-R Scores

	Incest (<i>n</i> = 124)				Extrafamilial (<i>n</i> = 92)			
	<i>Mean Scores</i>				<i>Mean Scores</i>			
	<i>n</i>	<i>PCL-R</i>	<i>IQ</i>	<i>% Recidivism</i>	<i>n</i>	<i>PCL-R</i>	<i>IQ</i>	<i>% Recidivism</i>
Group								
High PCL-R–High IQ	29	10.8	107.0	0.0	21	14.6	113.3	9.5
High PCL-R–Low IQ	37	12.1	85.3	10.8	24	17.5	87.7	29.2
Low PCL-R–High IQ	31	1.9	108.8	3.2	27	3.5	113.9	7.4*
Low PCL-R–Low IQ	27	2.3	87.7	3.7	20	2.6	89.7	0.0*

Note. PCL-R = Psychopathy Checklist–Revised.

*Significantly lower rate of recidivism than the High PCL-R–Low IQ group according to Kaplan–Meier pairwise comparisons.

between-group differences were not significant among incest offenders, χ^2 ($df = 3$) = 6.10, *ns*; the pairwise difference between the High PCL-R–High IQ and High PCL-R–Low IQ groups approached significance, χ^2 ($df = 1$) = 3.64, $p < .06$. The four groups of extrafamilial offenders differed significantly in their rate of sexual recidivism, χ^2 ($df = 3$) = 13.40, $p < .01$. Pairwise comparisons indicated that the High PCL-R–Low IQ group reoffended at a significantly faster rate than either the Low-PCL-R–High IQ group, χ^2 ($df = 1$) = 6.16, $p < .05$, or the Low-PCL-R–Low IQ group, χ^2 ($df = 1$) = 7.41, $p < .01$.

These results suggest that the interaction effect between psychopathy and intelligence on sexual recidivism occurred across the sample of child molesters, irrespective of type of victim relationship and despite differences in the intelligence, risk level, and recidivism rates between incest and extrafamilial offenders.

DISCUSSION

The primary goal of this study was to examine the relationships between intelligence, psychopathy, and offending in a sample of child molesters who completed a prison-based treatment program. Consistent with previous research, regression analyses showed that psychopathy was related to every offending outcome: sexual and nonsexual offense history and sexual, violent, and general recidivism. Although intelligence was not significantly related to offending, the interaction between intelligence and psychopathy was significant for each recidivism variable. Comparisons between four groups obtained by performing median splits on psychopathy and intelligence clarified this interaction: The group with relatively high PCL-R and relatively low IQ scores was more than 4 times as likely to have been reconvicted of a sexual offense and more than twice as likely to have been reconvicted of a violent or general offense compared to any other group. Results were similar for extrafamilial and incest offenders when examined separately.

These findings show that intelligence may moderate the relationship between psychopathy, as measured by the PCL-R, and reoffending in child molesters, particularly for sexual recidivism: Those with relatively high PCL-R scores and high IQ received convictions for

new sexual offenses at the same rate as those with low PCL-R scores. The present results thus extend Heilbrun's (1979) finding that IQ moderates the effects of psychopathy on violence to the prediction of child molester recidivism. In addition, no interaction effect was found between the Static-99 and intelligence on sexual or general recidivism. This suggests that the interaction with intelligence is specific to psychopathy as a personality construct and does not apply to actuarial risk in general.

The interaction between intelligence and psychopathy was apparent in terms of the predictive validity of the PCL-R for recidivism, as measured by the AUC. AUC values for the PCL-R were greater for offenders with relatively low IQ than for those with relatively high IQ for every type of recidivism (see Table 5). The AUC values for the PCL-R were always higher for low-IQ offenders and the full sample than those for the Static-99 and also generally higher than those obtained in previous studies. For example, in a comparative validity study, Barbaree et al. (2001) reported an AUC value of .61 for the PCL-R predicting sexual recidivism. By contrast, in the current study, the corresponding value was .73 for the full sample, increasing to .76 for relatively low-IQ offenders. The good predictive validity of the PCL-R is especially noteworthy given the comparatively low distribution of scores in our data ($M = 8.2$, compared to $M = 16.1$ in Barbaree et al., 2001). The most salient difference between our sample and that studied by Barbaree et al. is that ours consisted entirely of child molesters, whereas Barbaree et al.'s also included rapists. Although it is unclear whether these differences might have been responsible for the increased predictive validity of the PCL-R, our data suggest that the PCL-R can effectively predict recidivism in child molesters, especially if the offender's intelligence is taken into account.

An alternative way to view the interaction between psychopathy and intelligence is to note that recidivism rates were low for all offenders with relatively high IQ scores, even those in the high PCL-R group. According to this view, intelligence might be considered as a protective factor for recidivism—that is, above-average intelligence can mitigate the risk associated with relatively high PCL-R scores. The implication is that measures of intelligence should be included in assessments of child molesters and taken into account by clinicians, particularly in cases in which the PCL-R is used to predict risk. Our results suggest that although PCL-R scores are sensitive to risk for lower-intelligence sex offenders, they have limited predictive validity for those of higher intelligence. By contrast, the lack of a significant interaction with the Static-99 suggests that this instrument is a valid predictor of sexual recidivism regardless of IQ. This may not extend to violent recidivism, for which an interaction between PCL-R and Static-99 scores was found. However as the Static-99 was specifically designed to assess risk for sexual recidivism, it would be unlikely to be a primary consideration in violence risk assessments. Further research would be useful to examine the effect of intelligence on predictions of violent reoffending—for example, whether there might be an interaction between intelligence and a tool such as the Violence Risk Assessment Guide (VRAG; Harris, Rice, & Quinsey, 1993). This would be particularly important in light of the current findings given that PCL-R scores are included as a component within the VRAG.

The present finding of low recidivism rates among relatively high-IQ offenders also contributes to evidence that low intelligence is associated with pedophilia. For the relatively low-IQ group, the mean IQ was 87.07 (the corresponding mean for the relatively high IQ group was 110.68). In a recent meta-analysis, Cantor, Blanchard, Robichaud, and Christensen (2005) found that child molesters had lower IQ scores than other offenders and controls, with a mean of 95. Noting other findings of child molesters having greater frequencies of

childhood brain injury and nonrighthandedness (e.g., Blanchard et al., 2003; Cantor, Klassen, et al., 2005), Cantor et al. proposed that the IQ deficit might be related to biological factors associated with the emergence of pedophilia—specifically, a perturbation of brain development. Given the substantial evidence that psychopathy is associated with abnormal cognitive and autonomic functioning related to emotion processing (Herba et al., 2007), and recent reports that psychopathic personality in adulthood is correlated with psychophysiological reactivity at age 3 (Glenn, Raine, Venables, & Mednick, 2007), the present results encourage the speculation that a common biological antecedent might be responsible for the intelligence deficits and psychopathic personality features associated with pedophilia.

In summary, the interaction between psychopathy and intelligence found in this study supports past research (e.g., Heilbrun, 1979) suggesting that intelligence may moderate the effect of psychopathy on recidivism, extending this finding to sex offenders. The failure to find a corresponding interaction between intelligence and actuarial risk suggests that the effect is specific to psychopathy. These results have implications for the practice of risk assessment among child sex offenders, particularly the importance of taking an offender's level of intelligence into account.

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